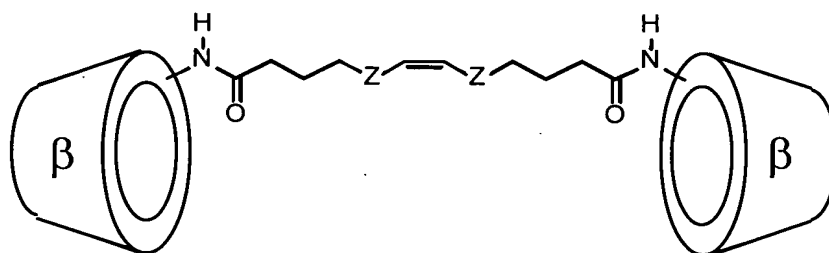
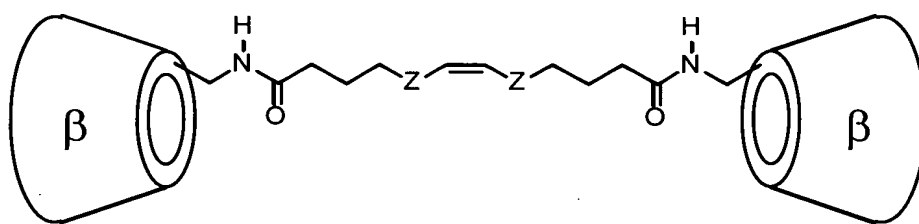
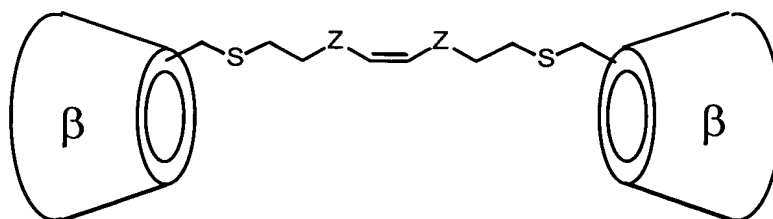


What is claimed is:

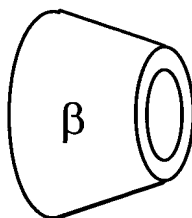
1. A composition of matter comprising two  $\beta$ -cyclodextrin molecules and a cleavable linker joining each such  $\beta$ -cyclodextrin, wherein the cleavable linker comprises a carbon-carbon double bond substituted on both ends, wherein the cleavable linker is cleavable by singlet oxygen, and wherein the composition of matter is selected from the group consisting of:



and



wherein

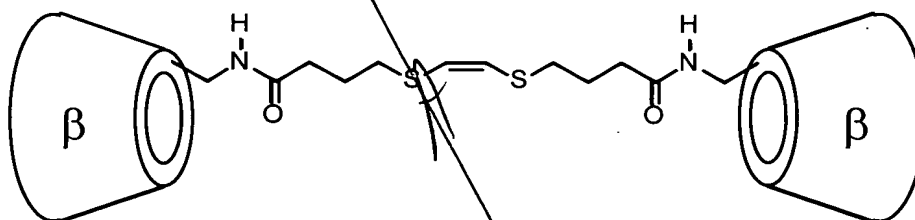


= beta-cyclodextrin; and

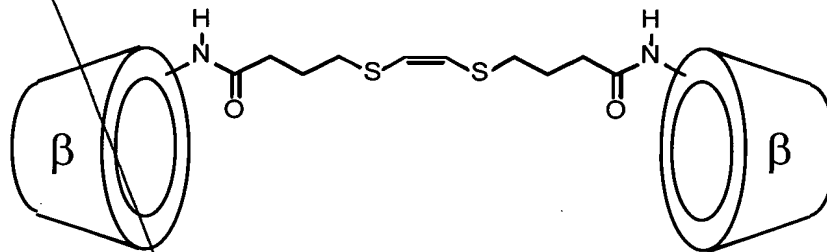
wherein Z is C<sub>1</sub>-C<sub>4</sub> alkyl, NH, N(C<sub>1</sub>-C<sub>4</sub> alkyl), O, or S.

2. The composition of matter of claim 1, wherein Z is S.

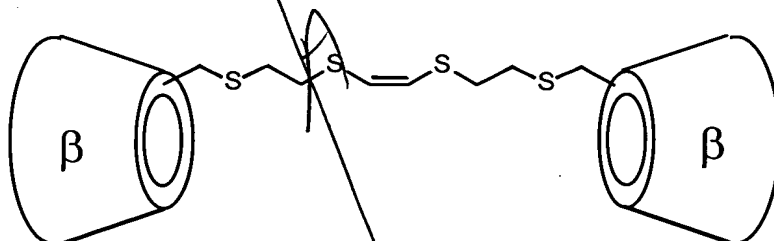
3. The composition of matter of claim 2, having the structure:



4. The composition of matter of claim 2, having the structure:



5. The composition of matter of claim 2, having the structure:



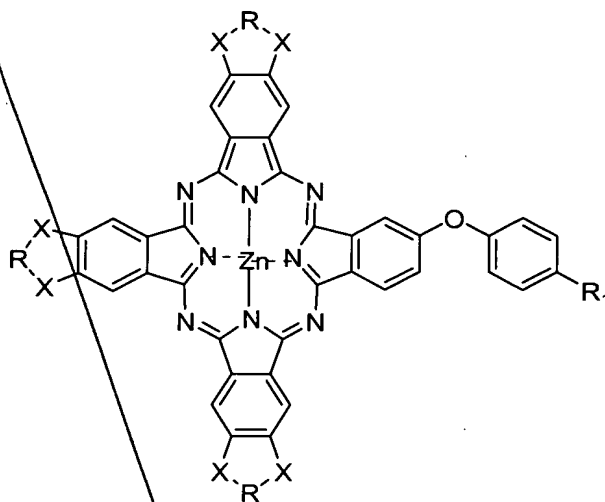
6. A composition which comprises a hydrophilic matrix comprising the composition of matter of any of claim 1, 2, 3, 4 or 5, and a photosensitizer encapsulated within the matrix.

7. The composition of claim 6, wherein the photosensitizer is a porphyrin, a phthalocyanine, a naphthalocyanine, a chlorin, a pheophorbide, or a bacteriopheophorbide.

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8. The composition of claim 7, wherein the photosensitizer is a phthalocyanine.

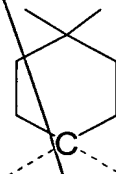
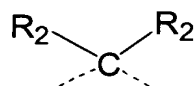
9. The composition of claim 8, wherein the phthalocyanine has the structure:



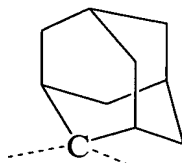
wherein X is C<sub>1</sub>-C<sub>4</sub> alkyl, NH, N(C<sub>1</sub>-C<sub>4</sub> alkyl), O, or S;

wherein R<sub>1</sub> is -CO<sub>2</sub>H, -CO<sub>2</sub><sup>-</sup>, -N<sup>+</sup>(CH<sub>3</sub>)<sub>3</sub>, -SO<sub>3</sub>H, or -SO<sub>3</sub><sup>-</sup>; and

wherein R is



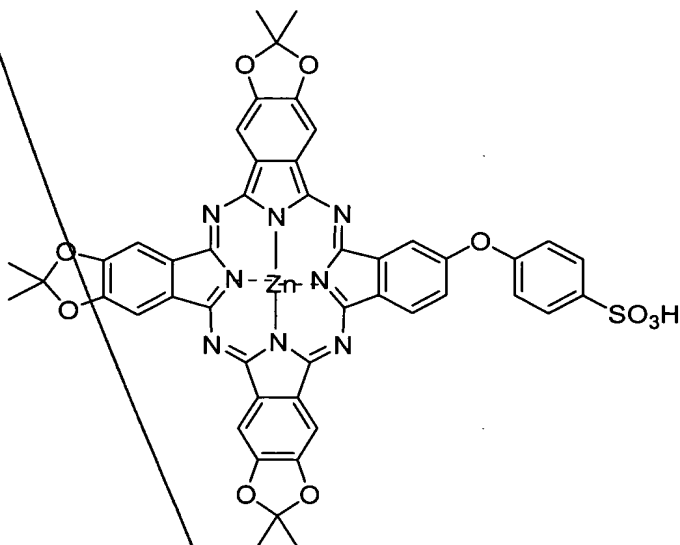
or



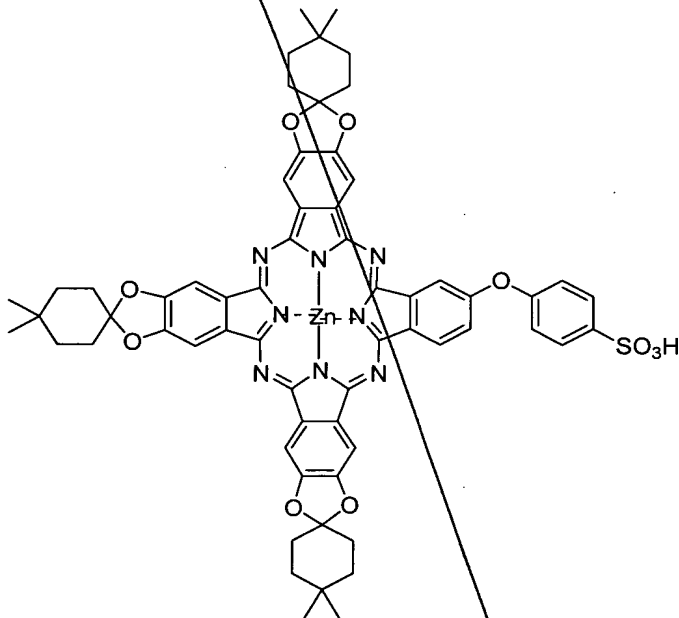
where the dashed lines indicate the attachments to X, and where R<sub>2</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl.

10. The composition of claim 9, wherein X is O, and  $R_1$  is  $-SO_3H$ .

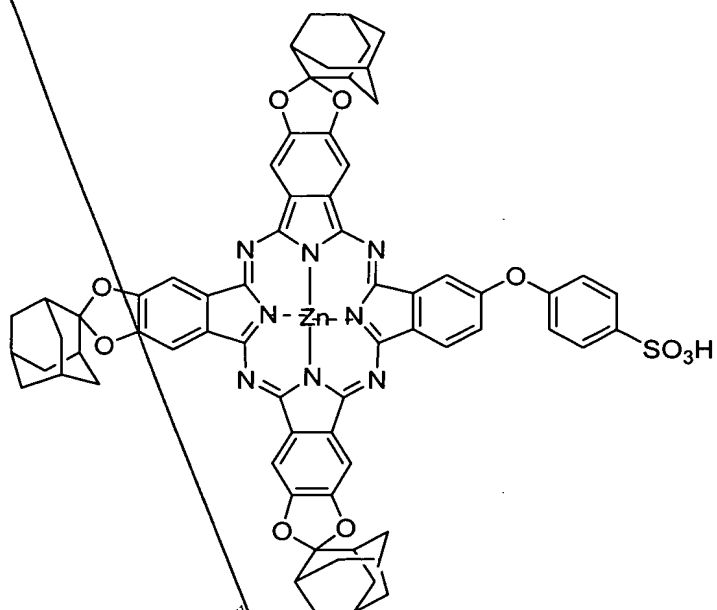
11. The composition of claim 10, wherein the phthalocyanine has the structure:



12. The composition of claim 10, wherein the phthalocyanine has the structure:

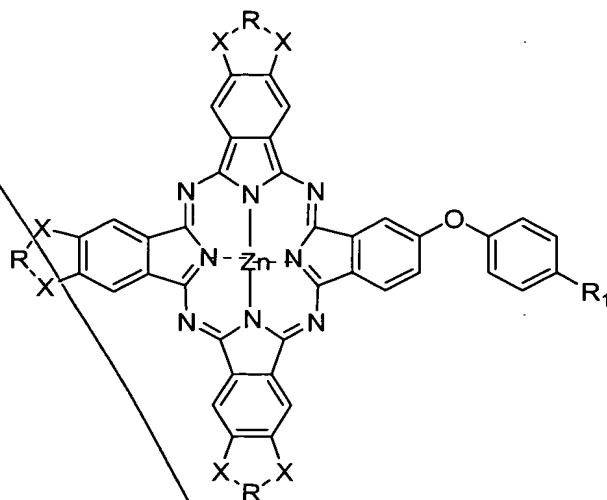


13. The composition of claim 10, wherein the phthalocyanine has the structure:



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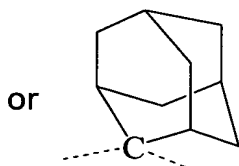
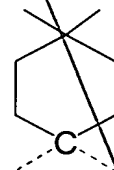
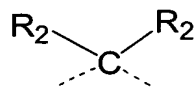
14. A compound having the structure:



wherein X is C<sub>1</sub>-C<sub>4</sub> alkyl, NH, N(C<sub>1</sub>-C<sub>4</sub> alkyl), O, or S;

wherein R<sub>1</sub> is -CO<sub>2</sub>H, -CO<sub>2</sub><sup>-</sup>, -N<sup>+</sup>(CH<sub>3</sub>)<sub>3</sub>, -SO<sub>3</sub>H, or -SO<sub>3</sub><sup>-</sup>; and

wherein R is



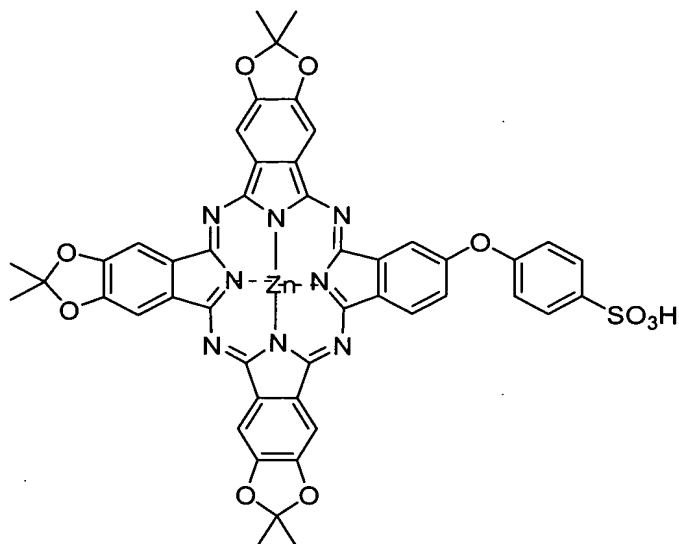
where the dashed lines indicate the attachments to X, and where R<sub>2</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl.

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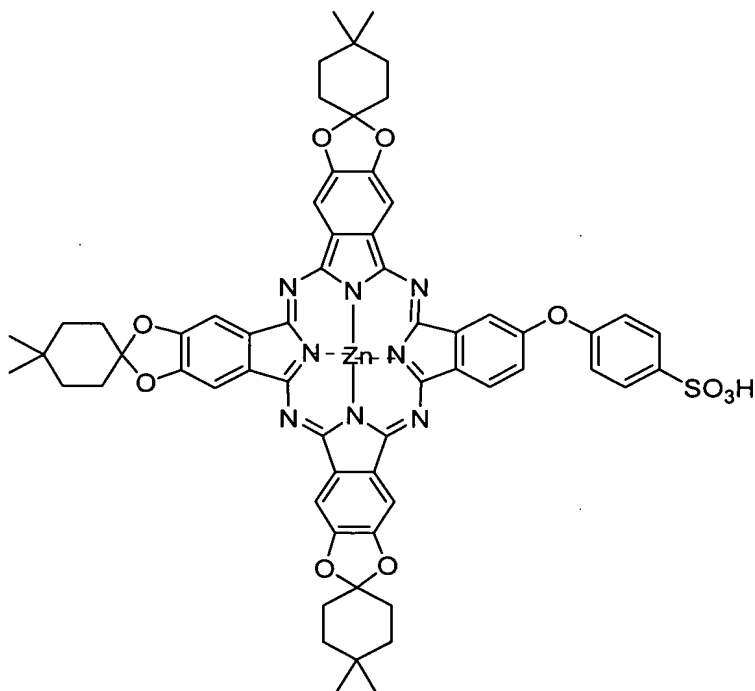
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15. The compound of claim 14, wherein X is O, and R<sub>1</sub> is -SO<sub>3</sub>H.

5 16. The compound of claim 15 having the structure:

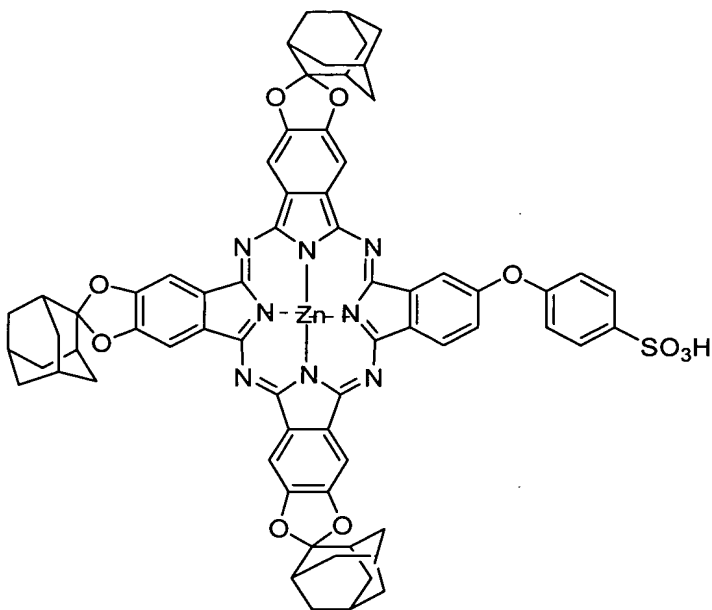


17. The compound of claim 15 having the structure:



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18. The compound of claim 15 having the structure:



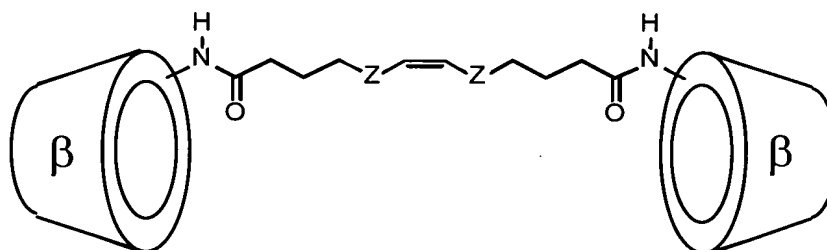
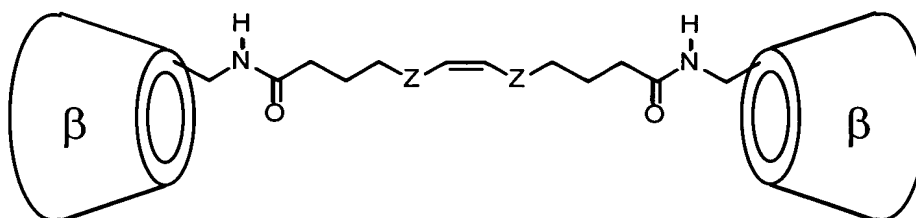
5 19. A composition which comprises a hydrophilic matrix comprising:

- Sub  
A'
- 10 i) the compound of any of claim 14, 15, 16, 17, or 18 encapsulated within the matrix, and
- 15 ii) a composition of matter comprising two  $\beta$ -cyclodextrin molecules and a cleavable linker joining each such  $\beta$ -cyclodextrin, wherein the cleavable linker comprises a carbon-carbon double bond substituted on one or both ends by an electron rich atom, and the cleavable linker is cleavable by singlet oxygen.

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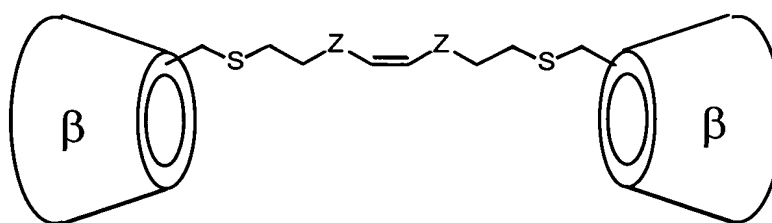
20. The composition of claim 19, wherein the electron rich atom is sulfur, oxygen, or nitrogen.

5 21. The composition of claim 19, wherein the composition of matter is selected from the group consisting of:



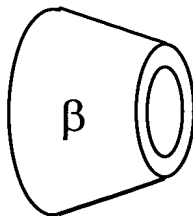
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and



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wherein

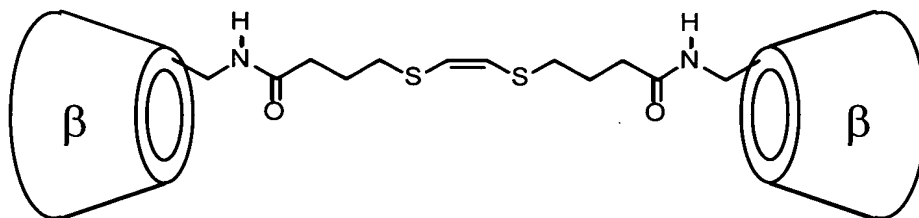


= beta-cyclodextrin; and

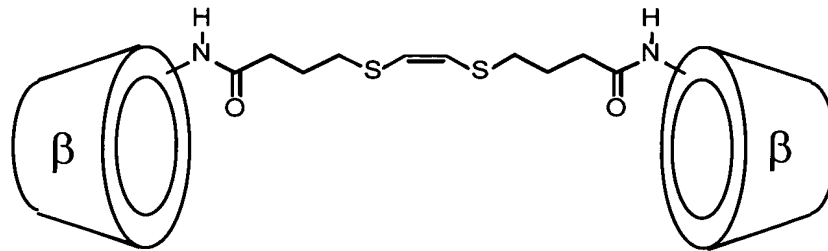
wherein Z is C<sub>1</sub>-C<sub>4</sub> alkyl, NH, N(C<sub>1</sub>-C<sub>4</sub> alkyl), O, or S.

22. The composition of claim 21, wherein Z is S.

23. The composition of claim 22, wherein the composition of matter has the structure:

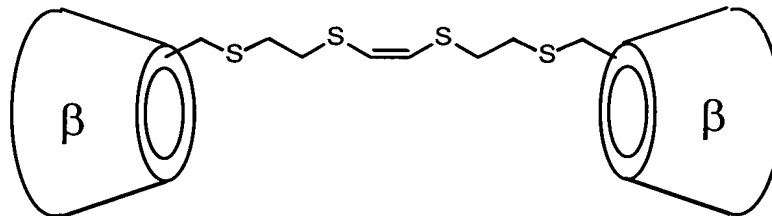


24. The composition of claim 22, wherein the composition of matter has the structure:



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25. The composition of claim 22, wherein the composition of matter has the structure:



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26. The composition of claim 6 or 19, wherein the cleavable linker is cleavable upon exposure to light of a wavelength appropriate for absorption by the photosensitizer.

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27. The composition of claim 6 or 19, wherein the photosensitizer is released when the cleavable linker is cleaved.

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A2

Sub  
5 B2

28. A method of killing a tumor cell which comprises contacting the tumor cell with the composition of claim 26 and exposing the composition to light so as to cleave the cleavable linker and release the photosensitizer, wherein absorption of light by the photosensitizer excites the photosensitizer and the tumor cell is killed by singlet oxygen that is formed by energy transfer from the excited photosensitizer.

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29. A method of killing a tumor cell in a subject which comprises:

- (a) administering the composition of claim 26 to the subject;
- 15 (b) directing light at the tumor cell so as to expose the composition to light and cleave the cleavable linker thereby releasing the photosensitizer, wherein absorption of light by the photosensitizer excites the
- 20 photosensitizer and generates singlet oxygen that is formed by energy transfer from the excited photosensitizer;
- (c) allowing additional composition to diffuse to the tumor cell; and
- 25 (d) repeating steps (b) and (c) until sufficient singlet oxygen is generated to kill the tumor cell.

30. The method of claim 29, wherein the photosensitizer is concentrated at the tumor cell.

31. The method of claim 28, wherein a plurality of converging light beams is used to focus light on the tumor cell.

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32. The method of claim 29, wherein a plurality of converging light beams is used to focus light on the tumor cell.

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